



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,728	08/17/2001	Robert Gellibolian	10010543-1	6224

7590 09/10/2002  
AGILENT TECHNOLOGIES, INC.  
Intellectual Property Administration  
Legal Department, DL429  
P.O. Box 7599  
Loveland, CO 80537-0599

EXAMINER

FORMAN, BETTY J

ART UNIT	PAPER NUMBER
----------	--------------

1634

DATE MAILED: 09/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/932,728

Applicant(s)

GELLIBOLIAN, ROBERT

Examiner

BJ Forman

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 and 22-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### **Election**

1. Applicant's election without traverse of Group V, Claims 16-21, filed 19 June 2002 in Paper No. 6 is acknowledged. Claims 1-15 and 22-24 are withdrawn from further consideration. Claims 16-21 are discussed below.

### **Information Disclosure Statement**

2. The references received with the Information Disclosure Statement of 16 July 2002 in Paper No. 7 have been reviewed and considered. Paper No. 7 did not include a 1449. Therefore, a signed copy of a 1449 is not included with this action. The references included in Paper No. 7 consist of: U.S. Patent No. 5,599,695; U.S. Patent No. 5,753,788; U.S. Patent No. 6,171,797; U.S. Patent No. 6,180,351; U.S. Patent No. 6,232,072; U.S. Patent No. 6,242,266; U.S. Patent No. 6,323,043; and U.S. Patent No. 6,329,143.

### **Claim Objections**

3. Claim 16 is objected to because of the following informalities:

- a. In line 7, "at" is incorrectly spelled "as".
- b. In line 13, "to" is incorrectly inserted after "to the".

Appropriate correction is required.

Art Unit: 1634

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 16-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16-21 are indefinite in Claim 16 because the claim is drawn to a method for "covalently binding layers of partially double-stranded oligonucleotide linkers" but the claim does not recite method steps for binding layers of linkers. Therefore, it is unclear how the method steps accomplish the claimed method. It is suggested that Claim 16 be amended to recited method steps for covalently binding layers.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Art Unit: 1634

7. Claims 16 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Goldberg et al (U.S. Patent No. 6,203,989 B1, filed 25 March 1999).

Regarding Claim 16, Goldberg et al disclose a method for covalently binding layers of partially double stranded oligonucleotide linkers onto a polynucleotide-target/polynucleotide-probe pair bound to an array to form a complex that can be detected by analysis comprising: binding an initial partially double stranded oligonucleotide linker to the target/probe pair the initial partially double stranded linker having at least two single-stranded oligonucleotide arms and forming a complex with at least two single-stranded arms; and repeatedly covalently binding one or more next partially double-stranded oligonucleotide linkers to the complex following association of the single-stranded arms of the complex to complementary single-stranded arms of the next partially double-stranded oligonucleotide linker, each one or more next double-stranded linker having a single-stranded oligonucleotide arm complementary to the one or more of the single-stranded arms of the complex and at least one arm not complementary to the single-stranded arms of the next double-stranded linkers (Column 7, lines 4-46; and Claims 1-5).

Regarding Claim 19, Goldberg et al disclose the method wherein each one or more next partially double-stranded oligonucleotide linker has a first end having one single-stranded arm complementary to the one or more single-stranded arms of the complex, a double-stranded body and a second end having two single-stranded arms not complementary to the single-stranded arms of the complex and not complementary to the arms of the one or more next partially double stranded linkers (Column 2, lines 43-67 and Claim 5).

Regarding Claim 20, Goldberg et al disclose the method wherein repeatedly comprises repeatedly covalently binding a first set of partially double-stranded oligonucleotide linkers to the complex and covalently binding a second set of partially double-stranded oligonucleotide linkers to the complex (i.e. successive layers, Column 6, lines 1-14 and Claim 5).

Art Unit: 1634

Regarding Claim 21, Goldberg et al disclose the method wherein after covalently binding of the one or more linkers to the complex with  $n$  single-stranded arms, the resulting complex has approximately  $2n$  single-stranded arms i.e. at least one non-annealed arm located on the outer surface of the matrix is free (Column 7, lines 26-32).

8. Claims 16 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Nilsen (U.S. Patent No. 6,274,723, filed 27 January 2000).

Regarding Claim 16, Nilsen discloses a method for covalently binding layers of partially double stranded oligonucleotide linkers onto a polynucleotide-target/polynucleotide-probe pair bound to an array to form a complex that can be detected by analysis comprising: binding an initial partially double stranded oligonucleotide linker to the target/probe pair the initial partially double stranded linker having at least two single-stranded oligonucleotide arms and forming a complex with at least two single-stranded arms; and repeatedly covalently binding one or more next partially double-stranded oligonucleotide linkers to the complex following association of the single-stranded arms of the complex to complementary single-stranded arms of the next partially double-stranded oligonucleotide linker, each one or more next double-stranded linker having a single-stranded oligonucleotide arm complementary to the one or more of the single-stranded arms of the complex and at least one arm not complementary to the single-stranded arms of the next double-stranded linkers (Column 8, lines 49-67; Column 9, line 55-Column 10, line 28; and Claims 1-12).

Regarding Claim 19, Nilsen discloses the method wherein each one or more next partially double-stranded oligonucleotide linker has a first end having one single-stranded arm complementary to the one or more single-stranded arms of the complex, a double-stranded

Art Unit: 1634

body and a second end having two single-stranded arms not complementary to the single-stranded arms of the complex and not complementary to the arms of the one or more next partially double stranded linkers (Column 5, lines 28-48).

Regarding Claim 20, Nilsen discloses the method wherein repeatedly comprises repeatedly covalently binding a first set of partially double-stranded oligonucleotide linkers to the complex and covalently binding a second set of partially double-stranded oligonucleotide linkers to the complex (Column 4, line 13-Column 5, line 14).

Regarding Claim 21, Nilsen discloses the method wherein after covalently binding of the one or more linkers to the complex with  $n$  single-stranded arms, the resulting complex has approximately  $2n$  single-stranded arms i.e. at least one non-annealed arm located on the outer surface of the matrix is free (Column 4, line 13-Column 5, line 14).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldberg et al (U.S. Patent No. 6,203,989 B1, filed 25 March 1999) in view of Urdea et al (U.S. Patent No. 5,124,246, issued 23 June 1992).

Art Unit: 1634

Regarding Claims 17 and 18, Goldberg et al teach the method for covalently binding layers of partially double stranded oligonucleotide linkers onto a polynucleotide-target/polynucleotide-probe pair bound to an array to form a complex that can be detected by analysis comprising: binding an initial partially double stranded oligonucleotide linker to the target/probe pair the initial partially double stranded linker having at least two single-stranded oligonucleotide arms and forming a complex with at least two single-stranded arms; and repeatedly covalently binding one or more next partially double-stranded oligonucleotide linkers to the complex following association of the single-stranded arms of the complex to complementary single-stranded arms of the next partially double-stranded oligonucleotide linker, each one or more next double-stranded linker having a single-stranded oligonucleotide arm complementary to the one or more of the single-stranded arms of the complex and at least one arm not complementary to the single-stranded arms of the next double-stranded linkers (Column 7, lines 4-46; and Claims 1-5) but Goldberg et al do not teach the initial partially double-stranded linker has a blunt, double-stranded end. However, Urdea et al teach a similar method comprising" covalently binding layers of oligonucleotide linkers onto a target/probe pair bound to an array to form a complex comprising" binding an initial linker to the target/probe pair and repeatedly covalently binding one or more oligonucleotide linkers to the complex (Column 8, line 67-Column 9, lines 30 and Claims 1-11) wherein the initial double stranded linker has a blunt end and wherein the method comprises forming a blunt end on the probe/target pair and ligating the blunt end of the linker to the blunt free end of the probe/target pair (Column 12, lines 30-40 and Fig. 3-2). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the sequence-specific hybridization and covalent binding of Goldberg et al with the blunt-end ligation of Urdea et al to thereby provide a sequence independent linker attachment for the obvious benefits of attaching the linkers to any probe/target pair. Specifically, the attachment of the linker to the probe/target pair of Goldberg et al comprises sequence-specific hybridization of



Art Unit: 1634

the linker to the probe/target pair which results in sequence-specific attachment of the linker. Because the attachment of Goldberg et al is sequence-specific, each sequence requires its own linker. The linker attachment of Urdea et al is via blunt end ligation of the linker to the probe/target pair. This attachment is sequence non-specific. Because the attachment is sequence non-specific, the linker is a universal linker which is attachable to any blunt ended sequence. Therefore, one skilled in the art would have been motivated to modify the sequence-specific linker attachment of Goldberg et al with the sequence non-specific blunt end ligation of Urdea et al thereby providing a universal linker for the obvious benefits of convenience and economy of linker synthesis.

11. Claims 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Nilsen (U.S. Patent No. 6,274,723, filed 27 January 2000).

Regarding Claims 17 and 18, Nilsen teaches the method for covalently binding layers of partially double stranded oligonucleotide linkers onto a polynucleotide-target/polynucleotide-probe pair bound to an array to form a complex that can be detected by analysis comprising: binding an initial partially double stranded oligonucleotide linker to the target/probe pair the initial partially double stranded linker having at least two single-stranded oligonucleotide arms and forming a complex with at least two single-stranded arms; and repeatedly covalently binding one or more next partially double-stranded oligonucleotide linkers to the complex following association of the single-stranded arms of the complex to complementary single-stranded arms of the next partially double-stranded oligonucleotide linker, each one or more next double-stranded linker having a single-stranded oligonucleotide arm complementary to the one or more of the single-stranded arms of the complex and at least one arm not

Art Unit: 1634

complementary to the single-stranded arms of the next double-stranded linkers (Column 8, lines 49-67; Column 9, line 55-Column 10, line 28; and Claims 1-12) but Nilsen does not teach the initial partially double-stranded linker has a blunt, double-stranded end. However, Urdea et al teach a similar method comprising covalently binding layers of oligonucleotide linkers onto a target/probe pair bound to an array to form a complex comprising binding an initial linker to the target/probe pair and repeatedly covalently binding one or more oligonucleotide linkers to the complex (Column 8, line 67-Column 9, lines 30 and Claims 1-11) wherein the initial double stranded linker has a blunt end and wherein the method comprises forming a blunt end on the probe/target pair and ligating the blunt end of the linker to the blunt free end of the probe/target pair (Column 12, lines 30-40 and Fig. 3-2). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the sequence-specific hybridization and covalent binding of Nilsen with the blunt-end ligation of Urdea et al to thereby provide a sequence independent linker attachment for the obvious benefits of attaching the linkers to any probe/target pair. Specifically, the attachment of the linker to the probe/target pair of Nilsen comprises sequence-specific hybridization of the linker to the probe/target pair which results in sequence-specific attachment of the linker. Because the attachment of Nilsen is sequence-specific, each sequence requires its own linker. The linker attachment of Urdea et al is via blunt end ligation of the linker to the probe/target pair. This attachment is sequence non-specific. Because the attachment is sequence non-specific, the linker is a universal linker which is attachable to any blunt ended sequence. Therefore, one skilled in the art would have been motivated to modify the sequence-specific linker attachment of Nilsen with the sequence non-specific blunt end ligation of Urdea et al thereby providing a universal linker for the obvious benefits of convenience and economy of linker synthesis.

Art Unit: 1634

**Prior Art**

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Usui (U.S. Patent No. 6,261,846 B1, filed 15 April 1999) teaches a method for binding layers of linkers onto a probe target pair.

**Conclusion**

13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



BJ Forman, Ph.D.  
Patent Examiner  
Art Unit: 1634  
September 3, 2002